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EXAMINER
ZHE, MENG YAO

ART UNIT	PAPER NUMBER
2195	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

	Application No.	Applicant(s)
	10/716,695	MOUNTAIN ET AL.
Office Action Summary	Examiner	Art Unit	
	MENGYAO ZHE	2195	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS,
WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed
  after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any
  earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☒ Responsive to communication(s) filed on <u>08 March 2010</u>.

2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.

3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is
closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) ☒ Claim(s) <u>1-8,11-13,30-35,37-48 and 51-53</u> is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5) ☐ Claim(s) _____ is/are allowed.

6) ☒ Claim(s) <u>1-8, 11-13, 30-35, 37-48, 51-53</u> is/are rejected.

7) ☐ Claim(s) _____ is/are objected to.

8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) ☐ The specification is objected to by the Examiner.

10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a) ☐ All b) ☐ Some * c) ☐ None of:

      1. ☐ Certified copies of the priority documents have been received.

      2. ☐ Certified copies of the priority documents have been received in Application No. _____.

      3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage
application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

1.   Claims 1-8, 11-13, 30-35, 37-48, 51-53 are presented for examination.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set
> forth in section 102 of this title, if the differences between the subject matter sought to be patented and
> the prior art are such that the subject matter as a whole would have been obvious at the time the
> invention was made to a person having ordinary skill in the art to which said subject matter pertains.
> Patentability shall not be negatived by the manner in which the invention was made.

2.   Claims 1-8, 31, 30, 41-48 are rejected under 35 U.S.C. 103(a) as being

unpatentable over Sankaranarayan and Forrest et al., Patent No. 6,799,208 (hereafter

Forrest) in view of Hunt, Patent No., 6,983,463 (hereafter Hunt).

3.   Hunt was cited in the previous office action.

4.   As per claims 1, 31, 41, Forrest teaches a method comprising:

Determining, by a computing device, the configuration of a system of resources

(Column 13, lines 1-22);

Determining, by the computing device, the processing requirements of an

application running on the system of resources (Column 9, lines 7-15, lines 20-34);

Analyzing, by the computing device, the determined configuration and requirements in order to attempt to optimize the performance of the application (Column 14, lines 5-9; Column 21, lines 6-18);

Generating, by the computing device, optimization suggestions from the analysis (Column 14, lines 17-30; Fig 11);

dynamically causing, by the computing device, applying of the optimization suggestions (Column 14, lines 32-40),

a static application characterization database storing information regarding fixed characteristics of the application (Column 9, lines 19-30).

Forrest does not specifically teach a dynamic application characterization database storing information regarding mutable characteristic of the application, wherein the static application characterization database is included with the dynamic application characterization database.

However, Hunt teaches a dynamic application characterization database storing information regarding mutable characteristic of the application, wherein the static application characterization database is included with the dynamic application characterization database (Abstract; Column 18, line 40-Column 19, line 30) for the purpose of optimizing application performances.

It would have been obvious to one having ordinary skill in the art at he time of the applicant's invention to modify the teachings of Forrest with a dynamic application

characterization database storing information regarding mutable characteristic of the application, wherein the static application characterization database is included with the dynamic application characterization database, as taught by Hunt, because it helps to optimize application performances.

5.   As per claims 2, 42, Forrest teaches wherein dynamically applying the optimization suggestions includes: dynamically allocating resources to the execution of and interaction with the application; dynamically utilizing acceleration tools (Column 5, lines 20-21, lines 26-28; Column 49, lines 15-27).

6.   As per claims 3, 43, Forrest teaches wherein dynamically utilizing acceleration tools includes utilizing tools selected from a group including: managed runtime optimization settings (Column 49, lines 23-27);

Forrest does not specifically teach primitive performance libraries and reordering portions of application execution.

However analyzing application performances and reordering its execution to give it advanced starting time is commonly practiced in the field of task management for the purpose of bringing lagging processes up to speed. It would have been obvious to one having ordinary skill in the art at the time of the applicant's invention to modify the teachings of Forrest in view of Hunt with the specifics of using optimization tools such as analyzing application performances reordering portions of application execution, because it helps to bring lagging applications up to speed.

7.   As per claims 4, 44, Forrest teaches wherein determining the configuration of a
system of resources includes utilizing a device and environment characterization
database (Column 13, lines 1-10, lines 22-30).

8.   As per claims 5, 45, Forrest teaches wherein the device database includes
information regarding the types of resources in the system of resources and information
regarding the physical capabilities of these resources (Column 8, lines 1-10; Column 10,
lines 40-50).

9.   As per claims 6, 46, Forrest teaches wherein the environment database includes
information regarding the configuration, substantially current status, and substantially
current capacity of the resources within the system of resources (Column 13, lines 1-12;
Column 15, lines 1-7; Column 48, lines 15-30).

10.   As per claim 30, Forrest teaches a system comprising:

a distributed application (Fig 2, unit 32);
a system of resources capable of executing the distributed application (Fig 2, unit 104);

a Content & Context Sensitive Accelerator capable of attempting to optimize the
performance of the distributed application (Column 21, lines 6-19);

a Device & Environment Database capable of providing information to the
Content & Context Sensitive Accelerator about the system of resources (Column 13,
lines 1-12; Column 15, lines 1-7; Column 48, lines 15-30);

an Application Characterization Database capable of providing information to the

Content & Context Sensitive Accelerator about the distributed application (Column 21,

lines 6-19);

unmanaged system software capable of utilizing and the system of resources (Column

14, lines 1-9).

Hunt teaches a dynamic application characterization database storing

information regarding mutable characteristic of the application, wherein the static

application characterization database is included with the dynamic application

characterization database (Abstract; Column 18, line 40-Column 19, line 30)

11.   As per claims 7, 47, Forrest does not specifically teach wherein device and

environment characterization database is incrementally generated as each of the

resources of the system of resources is powered-on.

However, it would have been obvious to one having ordinary skill in the art of

resource tracking to update the database tracking resource records only when the

resource is powered on, since otherwise, the powered off resource will have no way of

contacting the system and therefore the system can not know the existence of these

powered off resources.

12.   As per claims 8, 48, Forrest teaches wherein the device and environment

characterization database is dynamically generated utilizing a service including

determining availability of resources (Para 32).

Forrest does not specifically teach collecting data from sensors coupled with the
resources; analyzing the data collected; inferring an execution context characterization;
estimating the capacity of each resource; and updating the device and environment
characterization database.

However, in order to determine the availability of resources, it would have been
obvious to one having ordinary skill in the art of resource detection to follow the steps of
collecting data from sensors coupled with the resources; analyzing the data collected;
inferring an execution context characterization; estimating the capacity of each
resource; and updating the device and environment characterization database, since
these steps are essential to any methods involving resource calculations.

13.   Claims 11-13, 32-35, 37-40, 51-53 are rejected under 35 U.S.C. 103(a) as being
unpatentable over Sankaranarayan and Forrest et al., Patent No. 6,799,208 (hereafter
Forrest) in view of Hunt, Patent No., 6,983,463 (hereafter Hunt) further in view of
Bowman-Amuah, Patent No. 6,345,239 (hereafter Bowman).

14.   As per claims 13, 32, 53, Forrest teaches predicting application performance
after applying the suggested optimizations (Column 21, lines 6-18).

Forrest in view of Hunt does not specifically teach monitoring the actual
application performance to generate empirical data; comparing the actual application
performance to the predicted performance; and utilizing the empirical data when

analyzing the determined configuration and requirements in order to attempt to optimize the performance of the application.

However, Bowman teaches monitoring the actual application performance to generate empirical data; comparing the actual application performance to the predicted performance; and utilizing the empirical data when analyzing the determined configuration and requirements in order to attempt to optimize the performance of the application (Column 90, lines 30-44; Column 91, lines 4-14) for the purpose of making sure that the system is performing well.

It would have been obvious to one having ordinary skill in the art at the time of the applicant's invention to modify the teachings of Forrest in view of Hunt with the specifics of monitoring the actual application performance to generate empirical data; comparing the actual application performance to the predicted performance; and utilizing the empirical data when analyzing the determined configuration and requirements in order to attempt to optimize the performance of the application, as taught by Bowman, because it makes sure that the system stays on track.

15.   As per claims 11, 37, 51, Forrest does not specifically teach wherein the static application characterization database is generated utilizing:

determining, by the application's compile time, the data types utilized by the application; determining, by the application's compile time, the frequency of the usage of the data types; determining, by the application's compile time, the resource required by

the application; updating the static application characterization database with the

determined information.

However, since program analysis and optimization including steps mentioned

above are commonly performed at the time of the program's compilation, it would have

been obvious to one having ordinary skill in the art to have the steps above be done at

compile time for the purpose of making sure that the application will have all its needs

met before it is sent out to be executed.

16.   As per claims 12, 38, 52, Bowman teaches wherein the dynamic application

characterization database is generated utilizing: reading the static application

characterization database; collecting runtime application data usage; analyzing

application usage and identifying resource usage bottlenecks; updating the dynamic

application characterization database (Column 27, lines 15-30, lines 40-45, lines 50-65).

17.   As per claim 33, Forrest teaches wherein dynamically utilizing acceleration tools

includes utilizing tools selected from a group including: managed runtime optimization

settings (Column 49, lines 23-27);

Forrest does not specifically teach primitive performance libraries and reordering

portions of application execution.

However analyzing application performances and reordering its execution to give

it advanced starting time is commonly practiced in the field of task management for the

purpose of bringing lagging processes up to speed. It would have been obvious to one

having ordinary skill in the art at the time of the applicant's invention to modify the

teachings of Forrest in view of Hunt with the specifics of using optimization tools such

as analyzing application performances reordering portions of application execution,

because it helps to bring lagging applications up to speed.

18.   As per claim 34, Forrest teaches wherein the environment database includes

information regarding the configuration, substantially current status, and substantially

current capacity of the resources within the system of resources (Column 13, lines 1-12;

Column 15, lines 1-7; Column 48, lines 15-30).

19.   As per claims 35, 39, 40, Forrest teaches wherein the device and environment

characterization database is dynamically generated utilizing a service including

determining availability of resources (Column 21, lines 6-19).

Forrest does not specifically teach collecting data from sensors coupled with the

resources; analyzing the data collected; inferring an execution context characterization;

estimating the capacity of each resource; and updating the device and environment

characterization database.

However, in order to determine the availability of resources, it would have been

obvious to one having ordinary skill in the art of resource detection to follow the steps of

collecting data from sensors coupled with the resources; analyzing the data collected;

inferring an execution context characterization; estimating the capacity of each

resource; and updating the device and environment characterization database, since

these steps are essential to any methods involving resource calculations.

Response to Arguments

20.   Applicant's arguments with respect to claims 1-8, 11-13, 30-35, 37-48, 51-53

have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Any inquiry concerning this communication or earlier communications from the

examiner should be directed to MENGYAO ZHE whose telephone number is (571)272-

6946. The examiner can normally be reached on Monday Through Friday, 7:30 - 5:00

EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Meng-Ai An can be reached on 571-272-3756. The fax phone number for

the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the

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For more information about the PAIR system, see http://pair-direct.uspto.gov. Should

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Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a

USPTO Customer Service Representative or access to the automated information

system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Meng-Ai An/   /Mengyao Zhe/

Supervisory Patent Examiner, Art Unit 2195